PHENIX

TECHNICAL SUPPORT 2011

PHENIX WEEKLY PLANNING

7/28/2011

Don Lynch

PHENIX

TECHNICAL SUPPORT 2011

This Week

Removed VTX and sent to Chem lab for repairs/upgrades
FVTX assembly continues
BBC south & north removal
Remove north section of Bridge platform
Remove MMS east vertical lampshade
Remove RPC1 Prototype & RPC1 Prototype Absorber
RPC1, VTX, FVTX and MuTr work prep
Install new 1 ton cranes in IR
RPC1 Work permit
RPC1, VTX, FVTX and MuTr work prep
Procure manlift and station 1 scaffolding
Finished 10 re-purposed HV distribution box's
Finished 20 106 ft RPC 1 HV cables
Received 2 crimpers for RPC low voltage connectors.
Received 2 large HV distribution box's for the RPC 1 racks.
Fall Protection Training

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Next Week

- VTX testing and disassembly for repairs of VTX at Chem lab
- FVTX assembly continues
- BBC south removal
- Remove RPC1 Prototype & RPC1 Prototype Absorber
- Move CM south
- RPC1, VTX, FVTX and MuTr work prep continues
- Receive manlift and station 1 scaffolding
- Continue cable fabrication and assembly for RPC1
- Continue gas system tasks

General Tasks

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• Shutdown Prep	
• Procurement, Fabrication	In Progress
• Safety and Design reviews	In Progress
• Work Permits	In Progress
• Start of Shutdown WP	Done
• VTX Removal/FVTX/VTX Installation WP	Done
• RPC1 Prototype and proto absorber removal WP	Done
• MuTr Maintenance and Upgrade WP's (3 WP's Separate WP's for MMN and MMS access)	Done
• RPC1 Installation WP	7/29
• PC1 WP	Done
• BBC Removal/Maintenance/Re-installation WP	Done
• End of Shutdown WP	10/1
• Shutdown startup tasks	Done
• IR Crane repairs and upgrade (east done, west later)	In progress
• Remove section of Bridge platform above stat. 1 north	Done
• Remove MMS east vertical lampshade	Done
• Disassemble VTX services	Done
• Remove VTX and transport to Chemistry Lab	Done
• BBC North & South maintenance	7/21-10/30
• Upgrade AH crane	8/15-9/15
• DC/PC1 East/West troubleshooting as required	10/15-11/15
• Undefined detector subsystem maintenance and repairs	7/25-11/7
• Prep for EC roll in, reinstall MMS lampshade	11/3-11/7
• Roll in EC	11/10/2011
• Prep IR for run	11/10-11/17
• VTX, FVTX and RPC1 Services and commissioning (including 4 new racks)	9/16-11/30
• Pink/Blue/White sheets	11/17-11/30
Run 12 cooldown	12/1/2011

VTX/FVTX Tasks 2011 Shutdown

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- VTX/FVTX maintenance/upgrade and integration of FVTX onto VTX support structure

• VTX E & W in Chemistry Lab. LDTB test in Chem Lab	7/27
• VTX pixel electronics test to start (4-5 days)	7/28
• VTX Disassembly into 1/2 barrel layers starts. Hirose connector inspect	8/2-3
• FVTX Interconnect cables all available	8/5
• VTX LDTB spares available	8/5
• Spiro boards removed ready to ship for repair	8/9
• Hirose connector fix	8/9-9/5
• 6 FVTX ROCs available	8/31
• VTX spare pixel ladder at BNL. Ladder install starts. Physics lab	9/5
• FVTX, 1st 1/2 cage available. 1/2 cage system test in	9/12
• FVTX Remaining ROC boards at BNL	9/15
• JPS Meeting	9/16-20
• FVTX 1/2 cage install in VTX @ Chem lab. 1/2 cage + VTX ladder test start	9/19
• FVTX all 1/2 cages ready	9/22
• VTX+FVTX final installation to start	9/26
• Final VTX+FVTX Survey in Chem Lab	9/28-10/3
• VTX+FVTX ready to move to 1008	10/7

- VTX/FVTX Installation at 1008

• Build 2 FVTX racks	7/1-9/15
• Install VTX/FTX, Re-connect VTX services, Install FVTX services, survey and QA tests	10/17-10/28
• VTX/FVTX Commissioning & Contingency	10/31-12/31

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MuTr North Station 1 work

• Install access (Sta. 1 work platforms & CM west side hanging platform)	7/25-8/5
• Remove 1 section of bridge (1 week) (CAD Techs)	8/1-8/5
• Disconnect Cables, hoses etc, ID/label all (1 week)	8/8-8/12
• Remove FEE plates and chambers (1 week)	8/15-8/19
• Station 2 Maintenance/upgrade through access opened by station 1 removal (3 weeks concurrent with next task)	8/22/-9/9
• Clean/install new parts and upgrades (MuTr (3 weeks, concurrent At RPC Factory)	8/22/-9/9
• Re-install chambers and FEE plates (1 week)	9/12-9/16
• Re-cable, re-hose and test (3 weeks)	9/19-10/7

MuTr North & South Station 2 & 3 Re-cap clamps

(No internal work platforms to upper octants) (Need CAD Techs to remove MMS east vertical lampshade)	7/25-10/31

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RPC Tasks

2011 Shutdown

• Remove RPC1 prototype and prototype absorber	7/21-7/25
• Procurement and Assembly at RPC Factory	In Progress
• Pre-survey RPC1's at factory (2 weeks, 1 each for n & s)	7/25-8/12
• Build 1 new rack, upgrade existing RPC1 prototype rack	7/25-8/12
• Install north RPC1 (including north rack & services) (3 weeks)	8/15-9/2
• HV Tests, gas system calibration	9/2-10/7
• Move Station 1 work platforms to south station 1	10/10-10/14
• Install south RPC1 (including south rack) (3 weeks)	10/17-11/4
• RPC1 north and south commissioning	
• RPC3 HV Distribution modifications, gas distribution modifications, PS calibration HV and services testing	9/6-10/28

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Electronics Group 2011 Shutdown Tasks

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- CMT4 and CMT5 FVTX rack design and assembly for installation on the bridge. ***Design in progress.***

- FVTX Bias cable assemblies.
  48 eight pair #22AWG. 1680 ft total.
  384 RG-174 cables terminated with CPC and MMCX R/A conns. 1500 ft total.
  All parts are on order. Drawing finished and out for bid. .

-Purchase and install FVTX LV cables.
  Wedges: 96 eight pair #22AWG terminated in DF11 conns. 3400 ft total.
  ROCs: 24 twelve pair #16AWG terminated in TYCO 2-106527-4 conns. 900ft total.
  Cable is on order.

-All FVTX fiberoptics specify, purchase and install.
  MTP trunk order entered. Slow Controls fiber and patch bay order entered .

- FVTX LV output mapper boards. ***Eric Mannel is designing and we will assemble.***

- PbSc teminator board production. ***Part kit has been picked up. Terminators expected by 6/22.***
  MuTr capacitors are here

-West carriage ADAM system performance upgrade.
  Purchased a couple of Ethernet ADAMs for testing. Need to purchase a MODBUS server.

- Complete the GL1 6X1 Multiplexer assemblies and test. ***Layout stage begun .***

- LeCroy HV control retrofit testing. ***Waiting for documentation from Debrecen Institute.***

- Design/Install FVTX Interlock system.
  Paul with some input from me and John. Also we may try to repair the bad TC connections.

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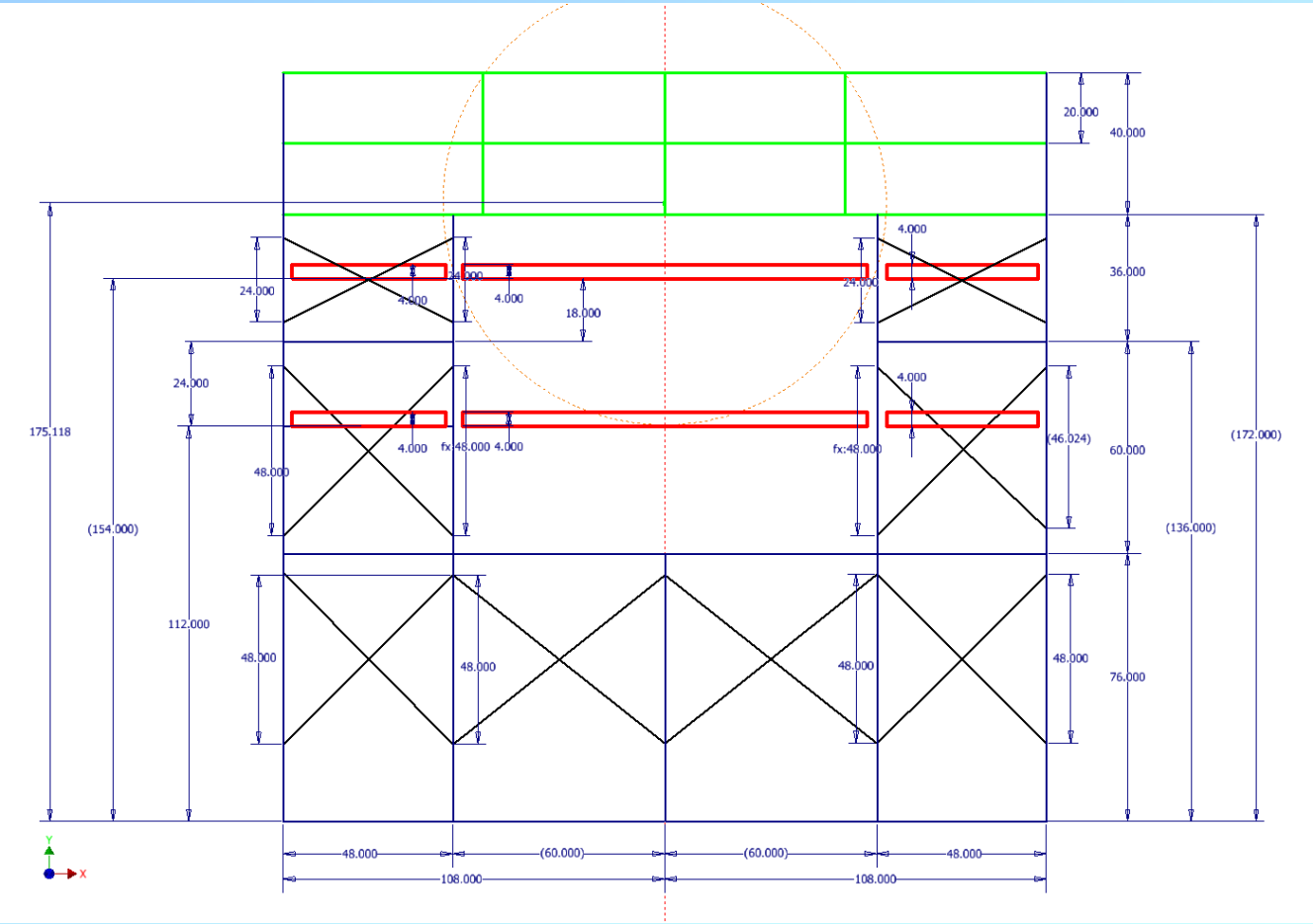
Station 1 scaffolding: redesigned to use SAFWAY pre-engineered free standing scaffold.



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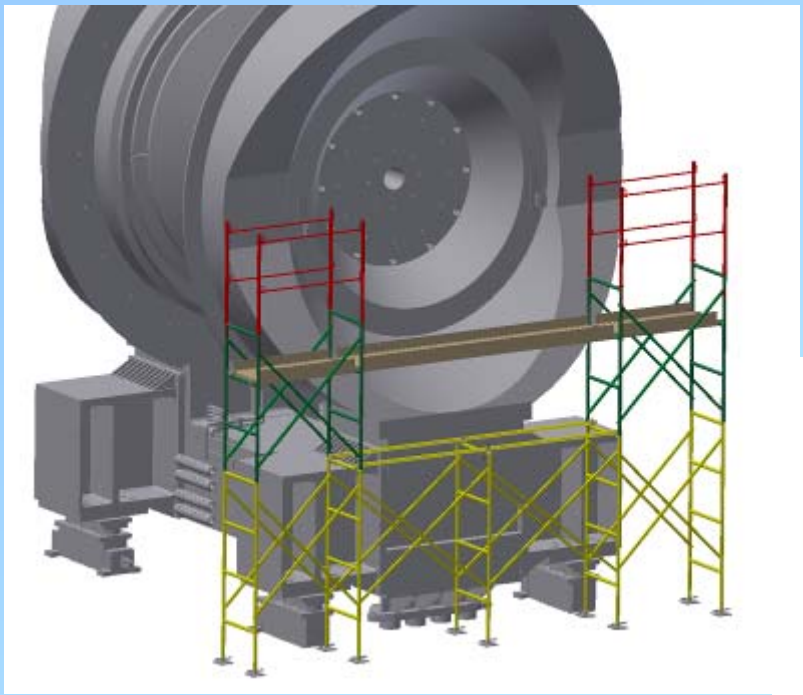

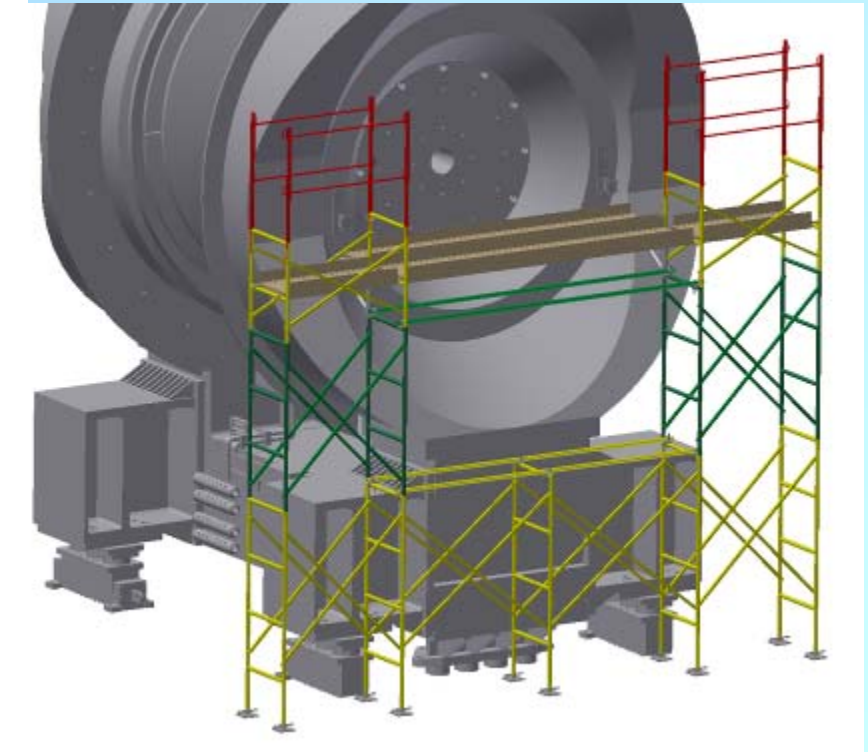

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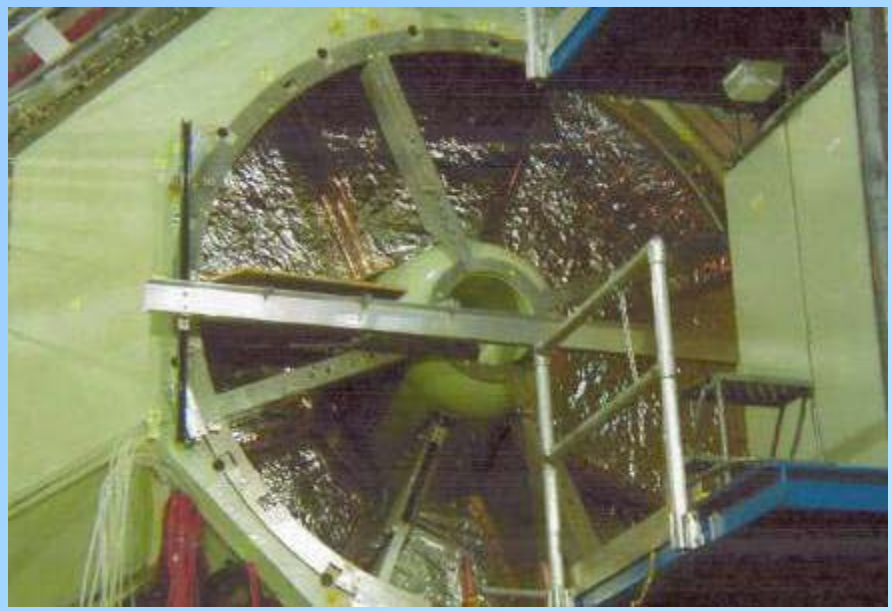

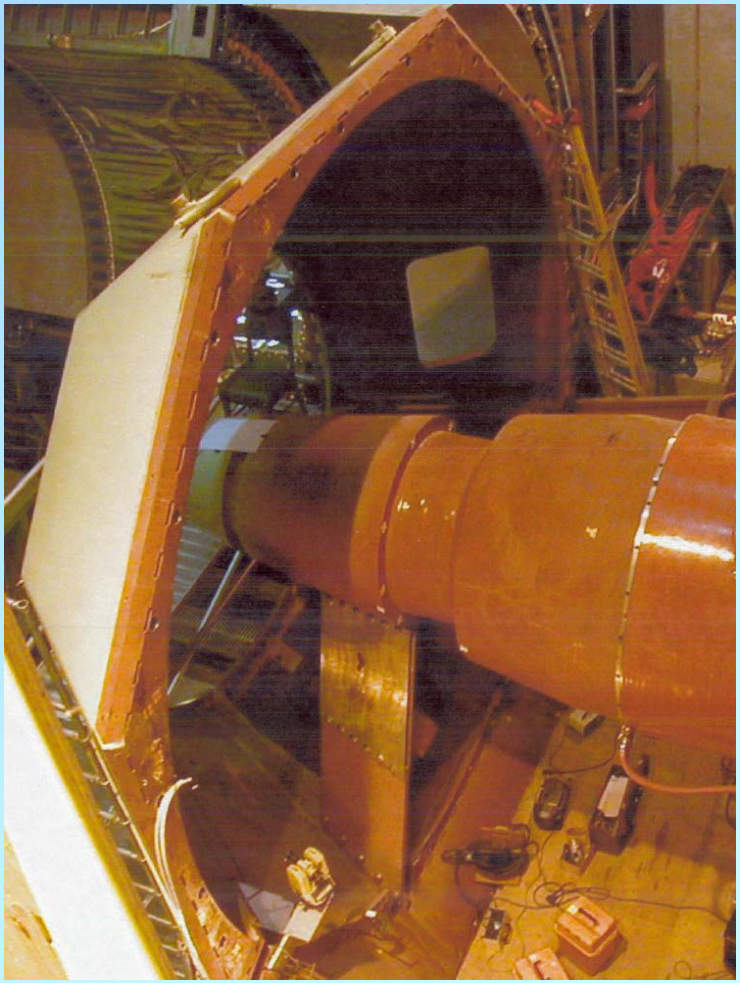

Station 2 access (MMS shown MMN is similar)

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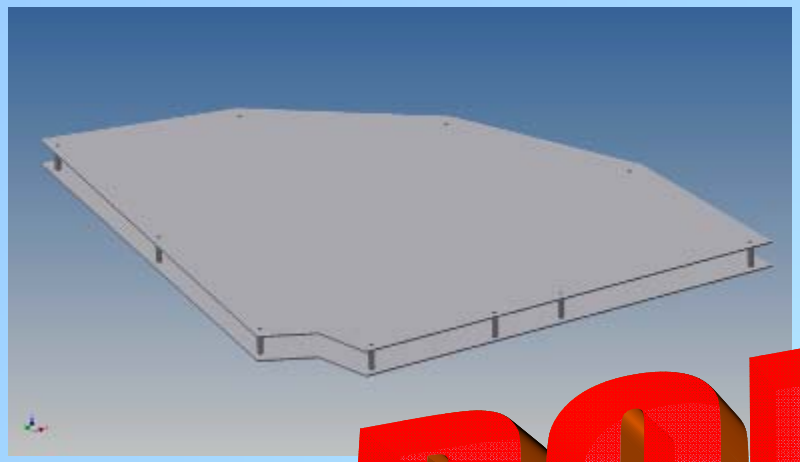

DONE

Dummy MuTr Station 1 Octant. Will be used to re-qualify vacuum lifting fixture and to practice using vacuum lifting fixture prior to removing station 1 north octants.

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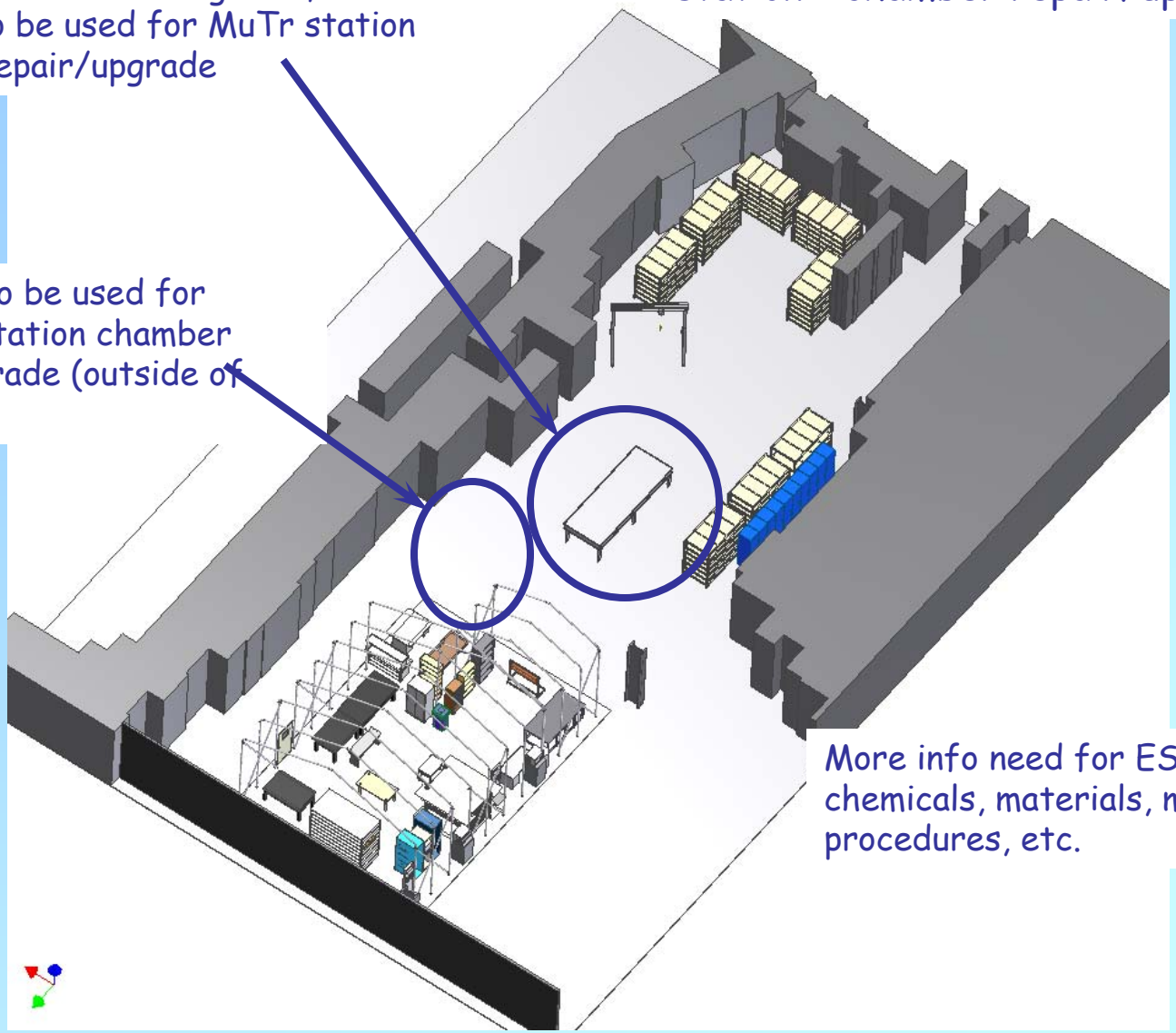
This area (previously occupied by burn-in test stand and enclosing tent, now just tent) to be used for MuTr station 1 chamber repair/upgrade

RPC Factory site to be utilized by both RPC1 fabrication/testing and MuTr station 1 chamber repair/upgrade

This area to be used for soldering station chamber repair/upgrade (outside of tents)



More info need for ESRC: chemicals, materials, methods and procedures, etc.

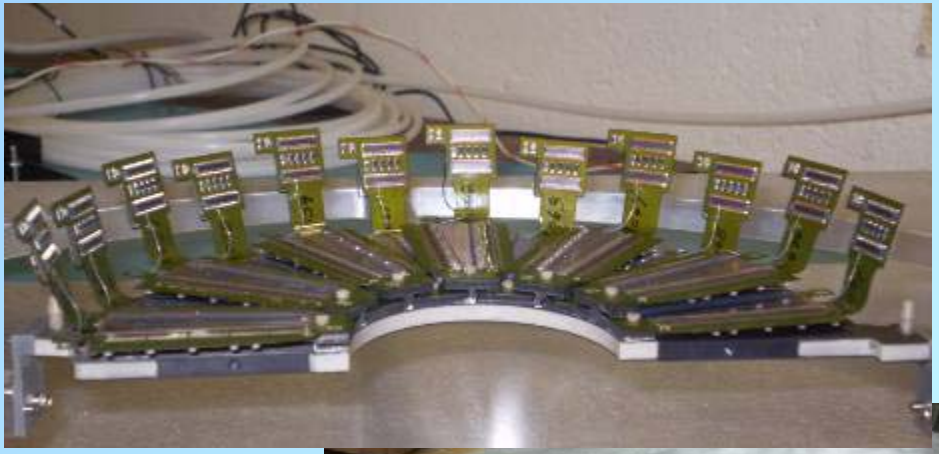
AH and IR Crane Corrective Actions

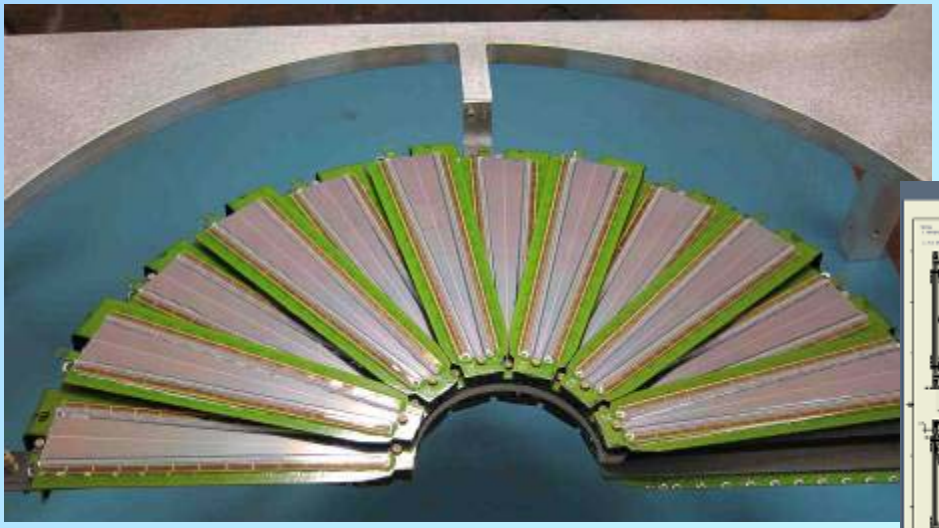
IR Crane 1 ton replacement parts received. Paul and Mike R. planning for upgrade work, test complete

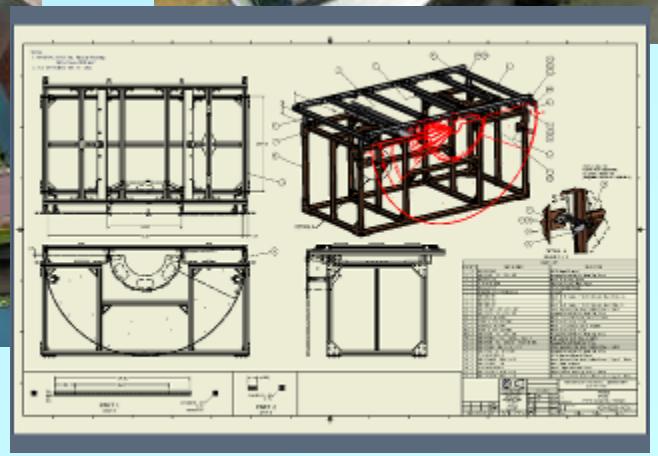
AH Crane:

Expect 10 ton crane to be back in service ASAP, ??

FVTX /VTX Assembly & Integration

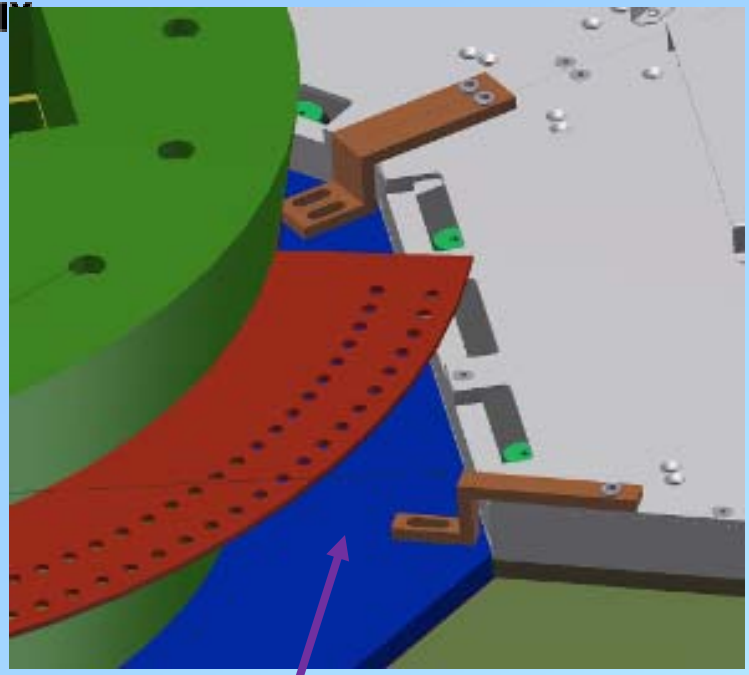


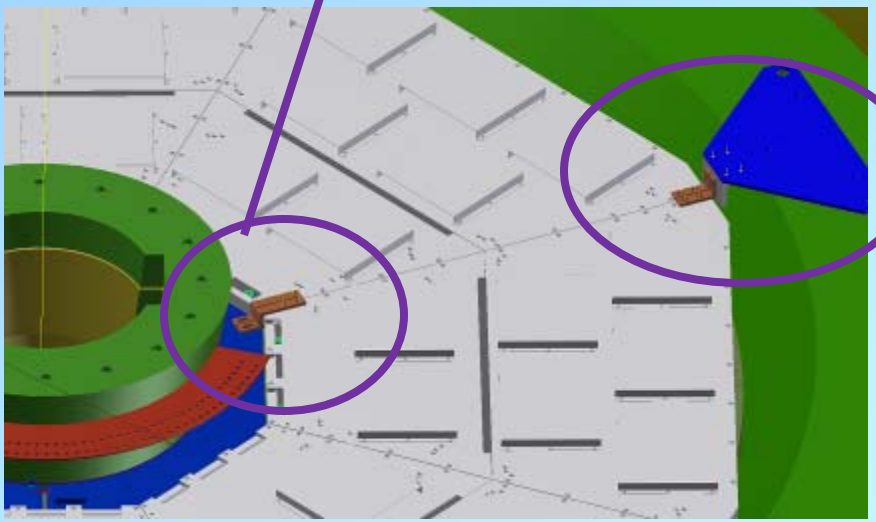


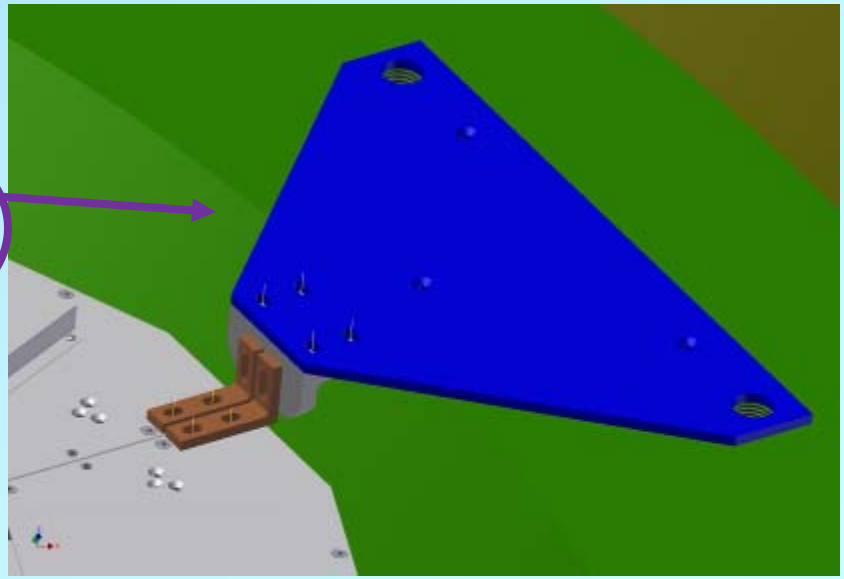


RPC1 Mounting Concept

Octants are individually mounted then tied together and supported at the outer octant boundaries by brackets mounted on existing tapped holes, and on inner edges by rings which wedge against the flower pot lead liner. Tapped holes in 8 places on each octant are used both to mount the absorber section and to attach the mounting brackets.







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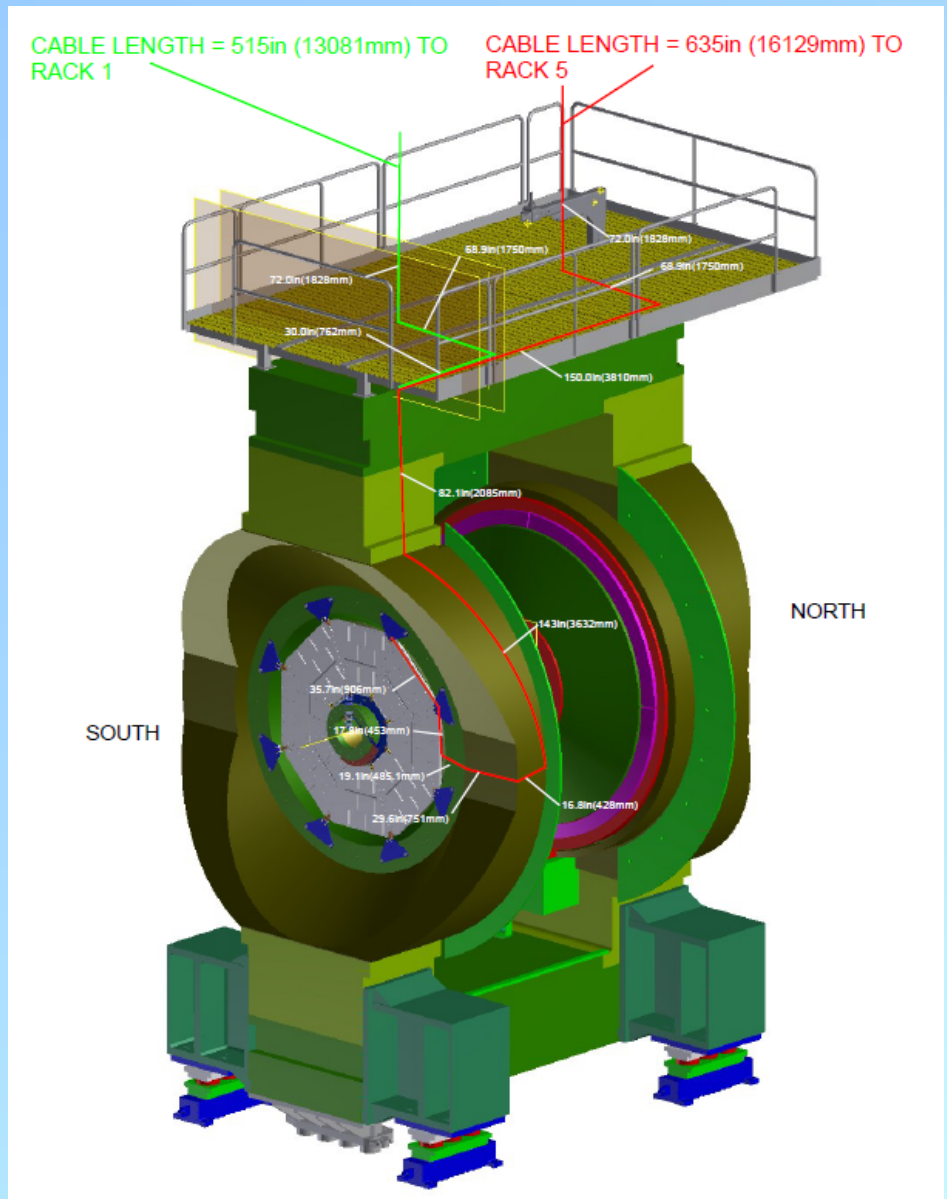

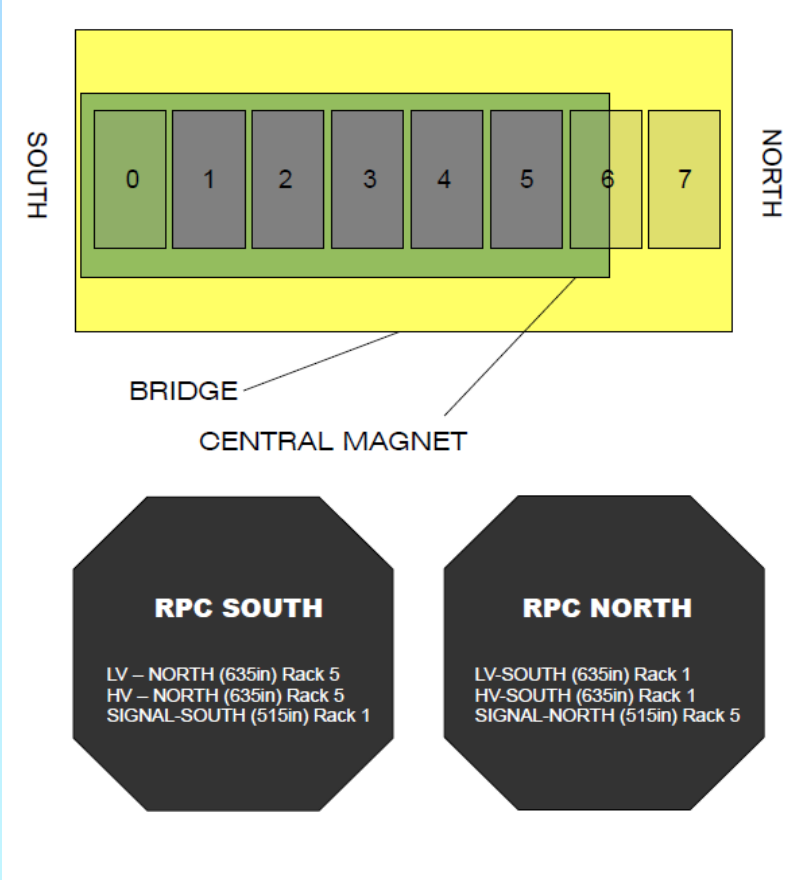

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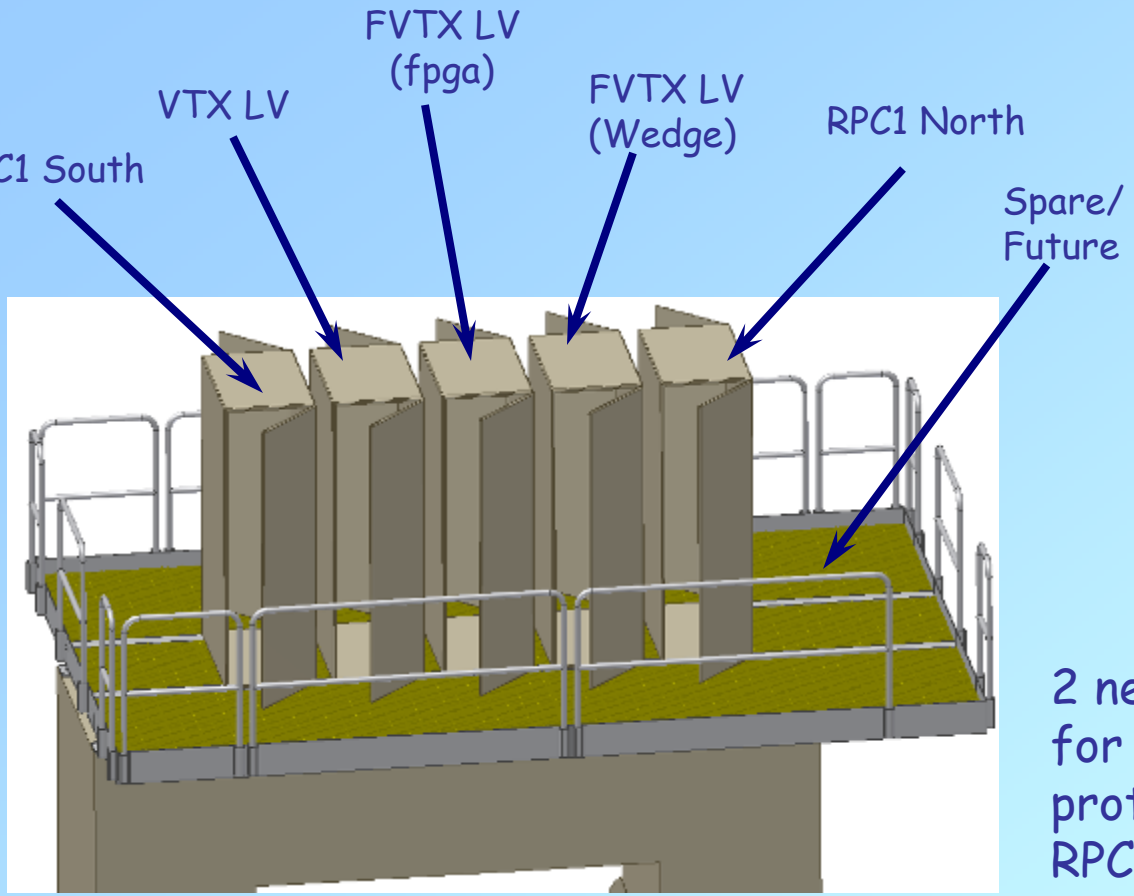
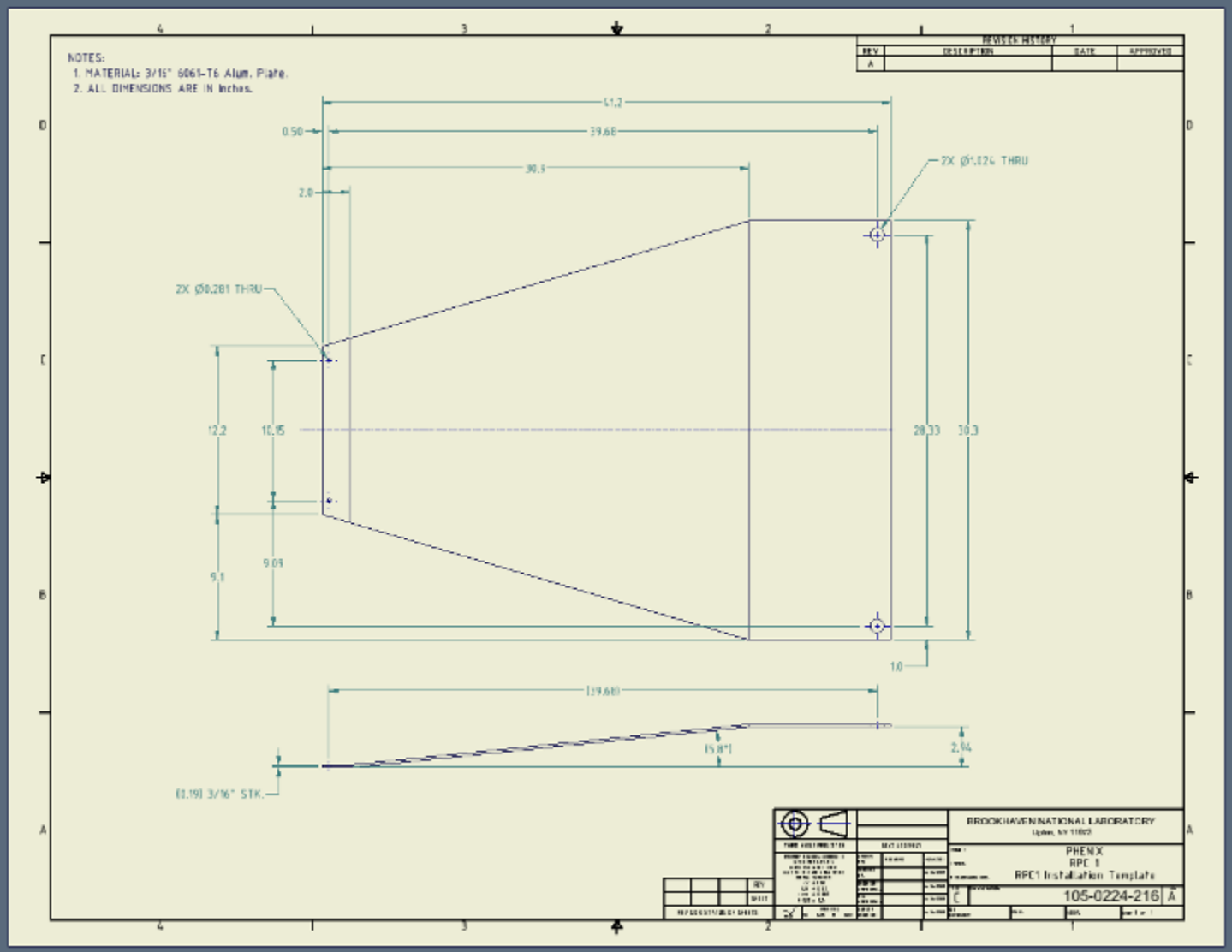


2 new racks to be added for FVTX, 1 new and prototype upgraded for RPC1. All racks will be equipped with standard PHENIX heat, smoke and water leak detection.

TECHNICAL SUPPORT 2011



2010 Building Maintenance Issues

- Roof leaks in utility bathroom at northwest corner behind tech offices, over door between rack room and assembly hall, over door between control room and elect. ass'y room, southeast corner of IR and laser room.

- Flooding in AH/ Driveway heaving

- Electronics test/assembly room-to-parking lot door (does not open/close/lock properly – needs to be replaced)

- Temperature in utility hall (where new air compressor is installed) is exceedingly high (transformer cases as high as 135 F)

PHENIX Procedure Review Current Status:

147 Procedures Identified

87 Made Inactive (not currently in use, will require revision to re- activate if and when necessary, available for reference purposes)

9 CAD procedures relevant to PHENIX, all are up to date and available on the CAD web site

43 PHENIX approved procedures.
all are current and up-to-date

9 Proposed/Draft Procedures (never previously formalized) (3 are ready for review) These will be addressed during next few months.

Web retrieval of latest procedures now available from PHENIX Internal:

http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_procedures.htm

All active Procedures are up to date through the end of 2011.

Safety, Security, Etc.

CAD ESRC Safety Review Action Items:

- Provide the latest schematics of the new FVTX readout boards to assure compliance with the agreement on fusing (Boose July 30, 2011)
- Review all new power supplies are NRTL equivalent compliant and affix respective labels (Giannotti July 30, 2011)
- Provide the new flammable gases leak rates for the new and re-installed systems as part of the PHENIX turn on plans (Pisani Dec 15, 2011)
- Assure security/ malware protection of the computing used to download the PLC systems (Haggerty-Giannotti July 30, 2011) - Done
- Provide details of the chemicals to be used in the repair of the Muon Tracking chambers (Lynch July 15, 2011) – Done
- Review and approve any conformal coating and chemical treatments for Muon Tracking chamber repair (Lynch-Cirnigliaro July 15, 2011) - under review
- Load test and certify the Muon Tracking Lifting fixture (Lynch-Gaffney July 15, 2011) - Done
- Review and approve the proposed scaffolding (Lynch-Tuozzolo July 30, 2011) - Submitted

Related items for this shutdown

- A plan for the RPC and Muon shielding upgrade inside the Nort anfdSouth Tunnels (Phillips)
- Better access to the PHENIX A/C systems in the IR (Phillips)

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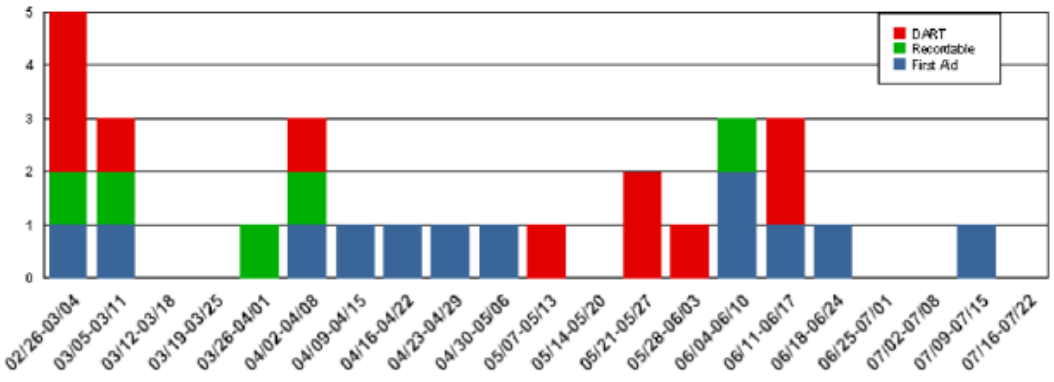
Injuries Per Week
As of 7/22/11



Injury Status:

FY11 YTD: DART – 23, TRC – 36, First Aid – 32
FY10: DART – 17, TRC – 32, First Aid – 52

Recent Injuries		
7/14/11	First Aid	A subcontractor working on the ISB construction site, was hit in the chest with a joist. He was transported to ER, had X-rays and was released. He returned to work the following morning, making this a First Aid case.

Recent Events		
7/19/11	Non-Reportable	A BNL vehicle backed into a personal vehicle in the parking lot of building #30. No injuries, no spills, no major property damage was reported. Minor damage to the private vehicle bumper was reported.
7/18/11	Non-Reportable	A BNL employee (Admin) from Biology reported shoulder pain, possibly caused from repetitive stress. The individual returned to work after making the report and will follow up with a doctor.
7/15/11	SC-4	At approximately 1:20pm on Friday, July 15, approximately 37 gallons of silicone oil leaked from a transformer located near Building 197, Photography and Graphic Arts. BNL Fire Rescue responded to contain the spill. However, some of the silicone-based oil did seep to soil prior to being entirely contained. The silicone oil is non toxic - does not contain Polychlorinated Biphenyl (PCB).
7/14/11	Non-Reportable	At approximately 3 PM on Wednesday, July 13, 2011, four visitors to the Building 560 4T MRI, entered a potentially magnetic area without first being screened for magnetic items on their possession as prescribed in facility procedures. Individual monitoring exposure limits specified in 10CFR 835.402 and hazard limits specified in 29 CFR Part 1910 were not exceeded as a result of this event.

Design and Plan of Resistive Plate Chamber Gas Purification System at the Pioneering High Energy Nuclear Interaction EXperiment

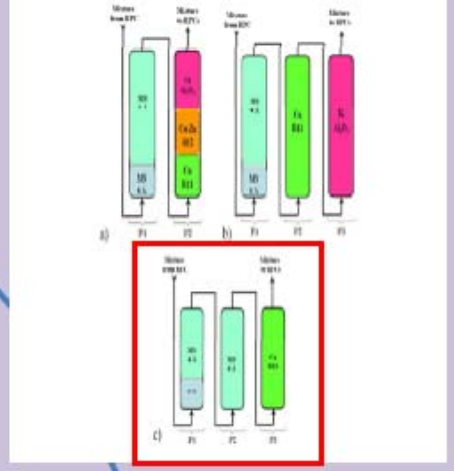
Morgan Poulos Keating

A short synopsis of how I spent my summer vacation with you!

The start of Summer

Gained a basic understanding of an RPC, why a gas purification system is needed and how it will function

Made contacts with Roberto Guida at CERN

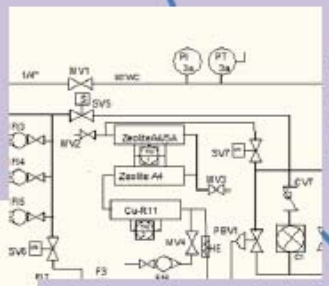


Possible RPC purifiers' configurations: a) configuration currently used at the LHC experiments, first b) and second c) optimized configurations

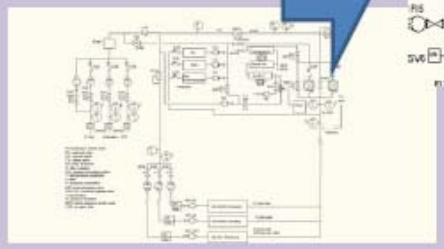
LOCATED VENDORS

ZEOCHEM-
Hydrophilic Molecular Sieves 5A and 4A
Switzerland
Phone- 1-502-634-7600
info@zeochem.com

BASF-
Cu R11 Adsorbent
North America
Phone-1-973-245-6000



Molecular Sieves to be regenerated at 500F run at room temp
Water adsorbtion capacity- 21% weight



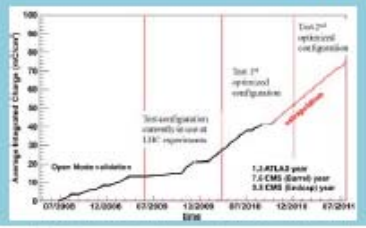
Bye BNL!

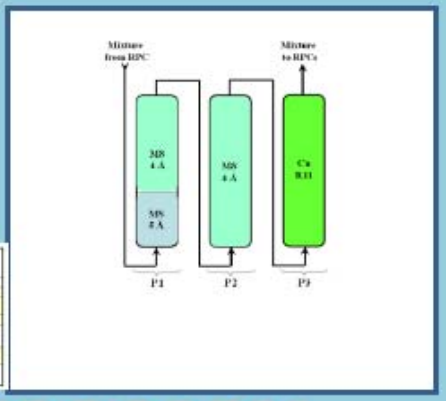
Design and Plan Of Resistive Plate Chamber Gas Purification System at the Pioneering High Energy Interaction EXperiment

Abstract

The Resistive Plate Chambers (RPC) used at the Pioneering High Energy Nuclear Interaction EXperiment (PHENIX) on the Relativistic Heavy Ion Collider (RHIC) ring at Brookhaven National Laboratory (BNL) are gaseous parallel plate detectors that provide timing information for collided beam particles. The gas inside these detectors is currently being used and then exhausted into the air when replaced by new, clean gas. In order to stop wasting these gasses, a closed loop gas purification and recirculation system is needed. These gasses must be cleaned before they are re-used because after the circulation of this specific gas mixture through the RPC, extra components tend to be produced. Without filtering, unnecessary Freons and hydrocarbons lower the effectiveness of the RPC. The RPC detectors in use at BNL are modeled after and almost identical to detectors used at the European Organization for Nuclear Research's (CERN) Large Hadron Collider. The scientists at CERN have been conducting experiments over many years to optimize the purifiers used in their closed loop system. Research and contacts were made to find out the conclusions of these experiments. Roberto Guida, an engineer at CERN, was contacted and documents were obtained explaining the latest purifier scheme. Due to the fact that the RPCs at CERN and the RPCs being used at BNL are almost exactly the same but of different scales, the design of the gas purification system here simply entails modifying the CERN setup. After analyzing flow rate and deciding on the proper volume of filter canisters of each MS 5A, MS 4A and Cu-R11 a design was drawn up on a AutoCAD. This drawing shows how the purifiers will be arranged and appropriate sizing specifications. The implementation of this system will be in the future due to the fact that this is part of a larger, long term project and proper installation planning must first take place.

Results





References

[1] S. Bianco, S. Colafranceschi, D. Colonna, F. Felli, T. Greci, A. Paolozzi, L. Passamonti, D. Pierluigi, C. Pucci, A. Russo, G. Saviano, M. Abbrescia, R. Guida, August 18, 2009, Chemical Analyses of Materials Used in the CMS RPC Muon Detector, CERN

[2] M. Capeans, I. Glushkov, R. Guida, S. Haider, F. Hahn, S. Rouwette, November 19,2010, Optimal Gas System for the Operation of Resistive Plate Chambers at the Large Hadron Collider Experiments, CERN PH-DT

[3] M. Capeans, et al., Nucl. Instr. and Meth. A (2010), doi:10.1016/j.nima.2010.08.077

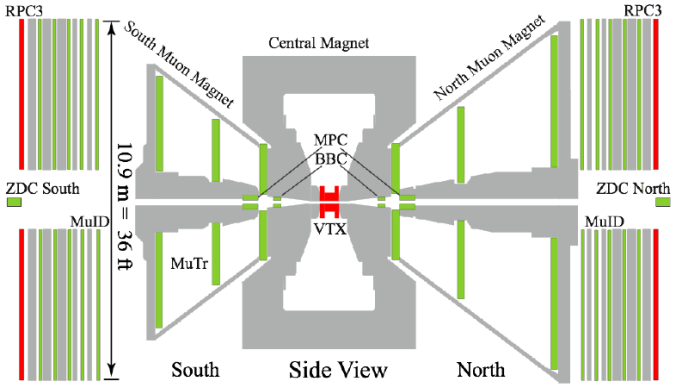
[4] R. Guida, B. Mandelli, June 20, 2011, Selection of purifiers for the RPC gas systems at LHC, CERN

Special thanks should be given to the scientists and engineers at CERN, specifically Roberto Guida, for all of his help in answering questions and the extensive work they put into finding the best filter configuration possible. Also, to my official Mentor, Robert Pisani as well as all of the kind, people at Brookhaven National Lab, who taught me more than I would have ever thought I could learn in one summer.

Morgan Poulos Keating (SUNY Maritime, Throggs Neck, NY 10465), Robert Pisani (Brookhaven National Laboratory, Upton, NY 11973).

Conceptual Design Study of the PHENIX Central Region Upgrade

By Alan Sweet



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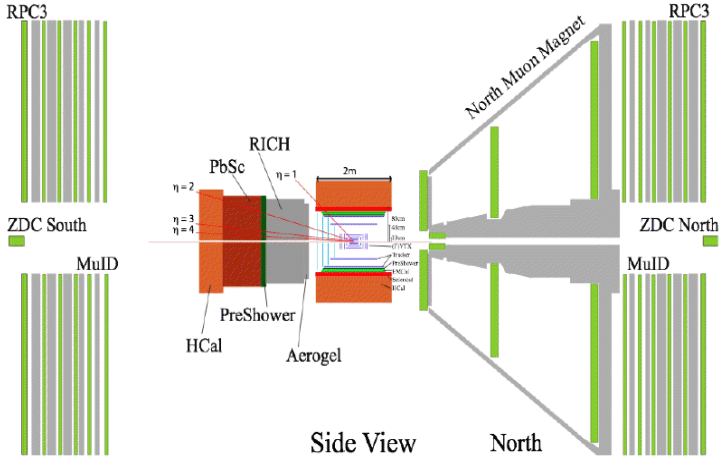

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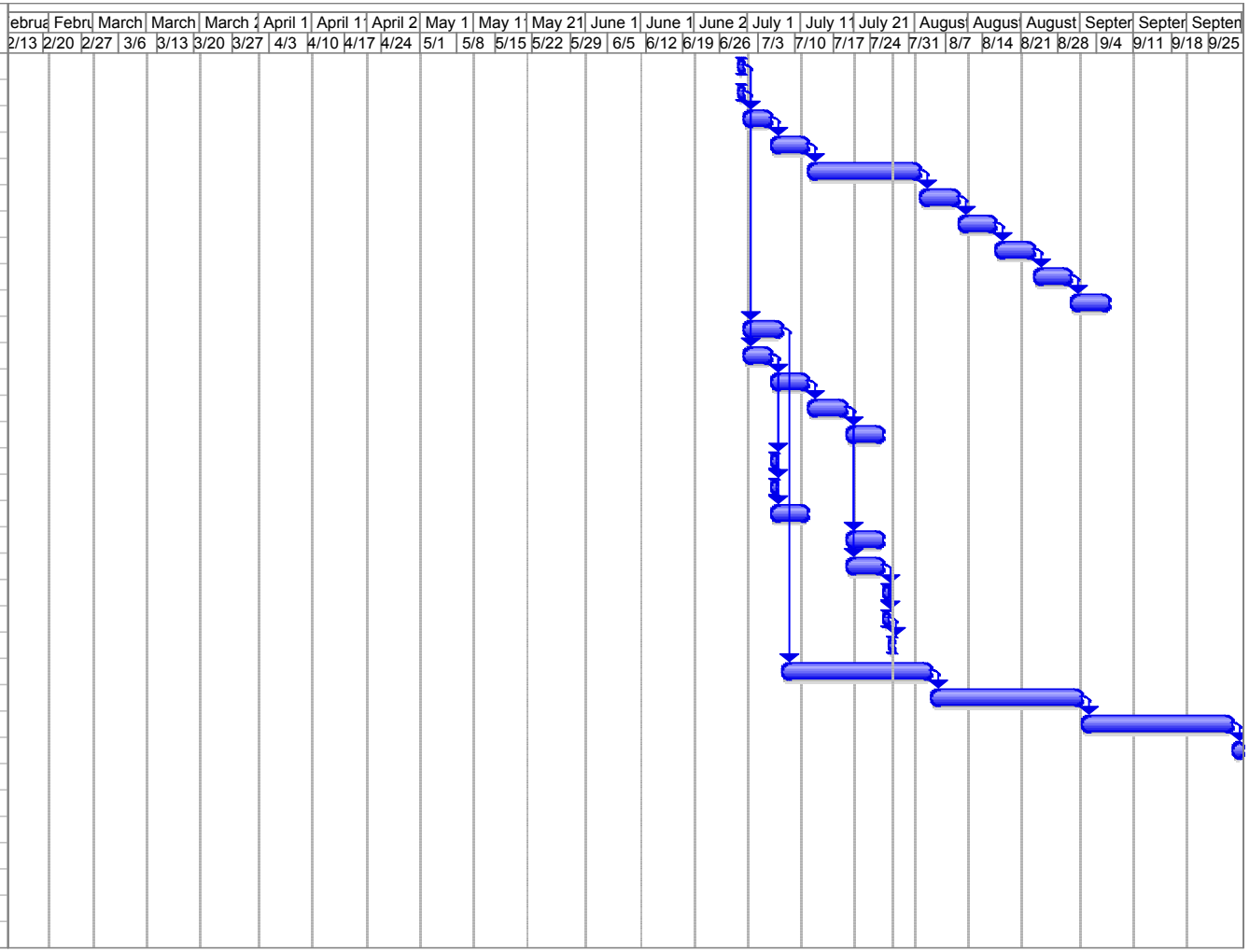
- Three 6 month periods
- Have new detectors/magnet installed for each run
- Don't interfere with running if possible
- Mobility of existing and new infrastructure
- Space constrictions

1st Period

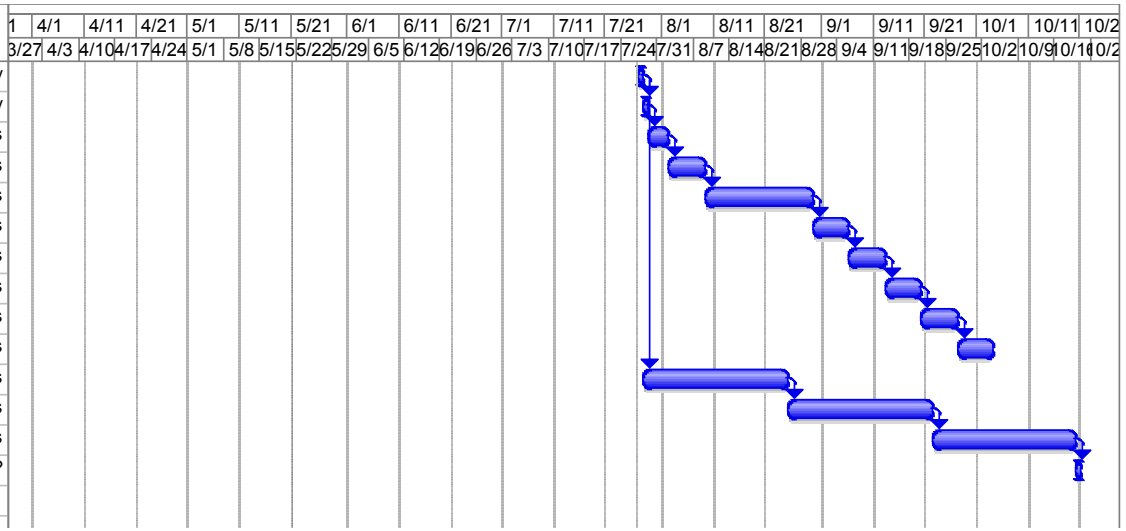
ID	Task Name	Duration
1	Remove Beam Pipe	1 day
2	Remove East Carriage	1 day
3	Disassemble, remove electronics	3 days
4	Remove DC salvage useful electronic	5 days
5	PC(1,2,3)	15 days
6	TEC	5 days
7	TOF East	5 days
8	RICH	5 days
9	Lead Glass	5 days
10	Lead Sintalator	5 days
11	Disassemble and Remove CM	5 days
12	MMS disassembled	3 days
13	MPC electronics removed	5 days
14	MU tracker 1	5 days
15	Eyebrow removed	5 days
16	Platforms	1 day
17	Tea-cup	1 day
18	5 lampshades	5 days
19	MU tracker 2	5 days
20	MU tracker 3	5 days
21	Internal Support Structure	1 day
22	Steel Piston	1 day
23	Separate back panal from bottom lan	1 day
24	Install New Solenoid	20 days
25	Install Barrel Preshower	20 days
26	Install Barrel EMCal	20 days
27	Install Barrel Hcal	20 days
28	Additional tracking layers	20 days
29	Return to run condition	5 days



About 5 months of work

2nd Period

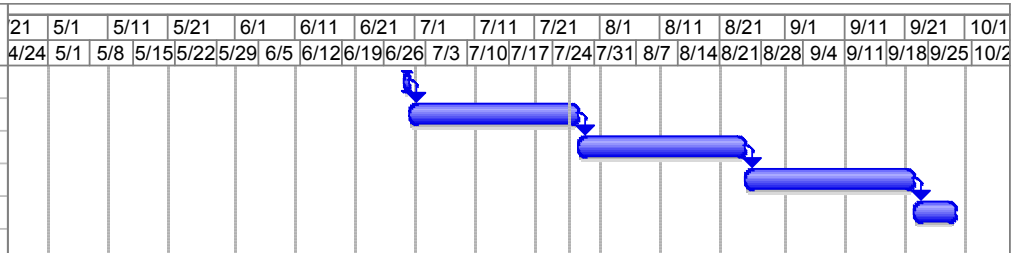
ID	Task Name	Duration
1	Remove Beam Pipe	1 day
2	Disassemble West Carriage	1 day
3	Disassemble, remove electronics	2 days
4	Remove DC salvage useful electronics	5 days
5	PC (1,2,3)	15 days
6	TEC	5 days
7	TOF west	5 days
8	RICH	5 days
9	Lead glass	5 days
10	Lead Sintalator	5 days
11	Install Forward Preshower	20 days
12	Install Forward EMCal	20 days
13	Install Forward Hcal	20 days
14	Return to run condition	1 day?



Only 3 months of work

3rd Period

ID	Task Name	Duration	Predecessors
1	Remove Beam Pipe	1 day	
2	Install Forward Magnet	20 days	1
3	Install Forward PID (RICH)	20 days	2
4	Install Forward tracking (GEMs)	20 days	3
5	Return to run condition	5 days	4



Where To Find PHENIX Engineering Info

~ 1 month in,
Progress is on schedule

Links for the weekly planning meeting slides, archives of past meeting slides,long term planning, pictures, videos and other technical info can be found on the PHENIX Engineering web site:

http://www.phenix.bnl.gov/WWW/INTEGRATION/ME&Integration/DRL_SSint-page.htm